form updated 11/01/99

Date:

Water Needs Assessment--Calculation of Past Beneficial Use, Current Conditions & Future Demand

Division: 40 **District:** 41

A G R I C U L T U R A L & M&I W A T E R S U P P L Y A N D D E M A N D: 1/

Contractor's Water Supply Sources and Quantities

	SURFACE WATER SUPPLY							GROUNDWATER				
Year	Reference Deliv/Max [acre-ft]	USBR Total Deliv/Max [acre-ft]	SWP [acre-ft]	Local [acre-ft]	Source	Trsfr/Retrn/ Recycle **In** [acre-ft]	Trsfr/Drain-age **Out** [acre-ft]	District [acre-ft]	Private [acre-ft]	Safe Yield [acre-ft]	GW Recharge [acre-ft]	TOTAL SUPPLY [acre-ft]
1												
Repr Yr:	2	3	4	5	6	7	8	9	10	11	12	13
1995												
2025												

Contractor's Agricultural Water Demands

Year	Crop Water Req [ac-ft] 2/	Distrct Irrig. Efficiency [%]	Effective Precipitatn [acre-ft]	Reference Effective Precipitatn [acre-ft]	Calculated Net Crop Water Req [acre-ft]	USBR Net Crop Water Req [acre-ft]	Average Irrigated Acres [acre]	Maximum Productive Acres [acre]	Calculated FDR [AF/acre]	USBR FDR [AF/acre]	Convey-ance Loss [acre-ft]	TOTAL AG DMND [acre-ft]
1												
Repr Yr:	15	16	17	18	19	20	21	22	23	24	25	26
1995												
2025												

Contractor's M&I Water Demands

Year	RESIDENTIAL WATER DEMAND			NONRESIDENTIAL WATER DEMAND			LOSS	Ref Urban Per Capita Dmd [gpcd]	Calculated Per Capita Dmd [gpcd]	TOTAL M&I DMND [acre-ft]	TOTAL Ag/M&I Dmd [acre-ft]	**UNMET DEMAND** dmnd - sup [acre-ft]
	Population [# Residnts]	Per Capita Dmd [gpcd]	Tot Demand [acre-ft]	Industrial [acre-ft]	Comm/Instit [acre-ft]	Tot Demand [acre-ft]	Unacc/Distr [acre-ft]					
1												
Repr Yr:	28	29	30	31	32	33	34	35	36	37	38	39
1995												
2025												

Comments:

1/ Water supply and demand information is for a normal year, hydrologically.

2/ Includes leaching requirement and cultural water, but not irrigation efficiency.

information from contractor's water management plan, or data submittal.

quality control check; information is either calculated by USBR staff, or from reference.

form updated 11/02/99

Water Needs Assessment--Calculation of Past Beneficial Use, Current Conditions & Future Demand

Definitions and equations

Contractor's Water Supply Sources and Quantities

Ref. No.	Title	Units	Description
1	Year		Time frame for the data analysis
2	SURFACE WATER - Reference Deliv/Max	[acre-ft]	Contractual water supply from USBR
3	SURFACE WATER - USBR Total Deliv/Max	[acre-ft]	Water deliveried from USBR supplies
4	SURFACE WATER - SWP	[acre-ft]	Water deliveried from State Water Project supplies
5	SURFACE WATER - Local	[acre-ft]	Water deliveried from Local supplies (non-USBR/SWP)
6	SURFACE WATER - Source		Water source for Local supplies (non-USBR/SWP)
7	SURFACE WATER - Trsfr/Retrn/Recycle In	[acre-ft]	Supplies transferred, returned, or recycled into the District
8	SURFACE WATER - Trsfr/Drainage Out	[acre-ft]	Drainage water or Supplies transferred out the District (include Minor M&I water deliveries)
9	GROUNDWATER - District	[acre-ft]	Ground Water pumped by or for the District
10	GROUNDWATER - Private	[acre-ft]	Ground Water pumped by and for private entities in the District
11	GROUNDWATER - Safe Yield	[acre-ft]	Perennial groundwater yield during a normal water year.
12	GROUNDWATER - GW Recharge	[acre-ft]	Planned recharge to the GW aquifer for recovery by the District or its water users
13	TOTAL SUPPLY	[acre-ft]	Net water supply available to the District for delivery to its water users

Calculations

Ref.													
13	=	No. 3	+	No. 4	+	No. 5	+	No. 7	+	No. 9	+	No. 10	-	No. 8	-	No. 12
	=	(USBR Total Deliv/Max	+	SWP	+	Local	+	Trsfr/Retrn/Recycle In	+	District GW	+	Private GW)	-	(Trsfr/Drainage Out)	-	(GW Recharge)

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Water Needs Assessment--Calculation of Past Beneficial Use, Current Conditions & Future Demand

Definitions and equations

Contractor's Agricultural Water Demands

Ref. No.	Title	Units	Description
15	Crop Water Req	[ac-ft]	Crop water use (consumptive use) that includes leaching requirement and cultural water, but not irrigation efficiency.
16	Distrct Irrig. Efficiency	[%]	Net aggregate water use efficiency on a district wide level
17	Effective Precipitatn	[acre-ft]	Rainfall is used to meet the crop water requirement.
18	Reference Effective Precipitatn	[acre-ft]	Effective precipitation calculated from the annual rainfall
19	Calculated Net Crop Water Req	[acre-ft]	Calculated from District records
20	USBR Net Crop Water Req	[acre-ft]	Calculated from District cropping patterns using CA DWR references
21	Average Irrigated Acres	[acre]	Irrigated acres crops were grown including multiple cropped acreage
22	Reference Irrigated Acres	[acre]	Irrigated acreage from USBR records or District Submittal
23	Calculated FDR	[AF/acre]	Calculated from District records
24	USBR FDR	[AF/acre]	Calculated from District cropping patterns using CA DWR references
25	Conveyance Loss	[acre-ft]	Seepage, evaporation, leaks, operational spills, etc. attributed to the District conveyance system not accounted for elsewhere
26	TOTAL AG DMND	[acre-ft]	Gross water requirement needed by the District to meet crop water requirements
	Maximum Productive Acres	[acre]	Physical irrigated acreage limit where the District can supply water

Calculations

18	= (Calculated Reference Effective Precipitation using CA DWR references in ac-ft/ac)*(Average Irrigated Acres)
19	= (Crop Water Req - Effective Precipitatn)/(Distrct Irrig. Efficiency)
20	= (USBR FDR)*(Reference Irrigated Acres)
23	= (Calculated Net Crop Water Req)/(Average Irrigated Acres)
26	= (Calculated Net Crop Water Req)+ (Conveyance Loss)

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Definitions and equations

Contractor's M&I Water Demands

Ref. No.	Title	Units	Description
28	RESIDENTIAL WATER DEMAND; Population	[# Residnts]	Number or people served
29	RESIDENTIAL WATER DEMAND; Per Capita Dmd	[gpcd]	Average interior & exterior water use per person per day in gallons
30	RESIDENTIAL WATER DEMAND; Tot Demand	[acre-ft]	Annual water deliveried to residential customers
31	NONRESIDENTIAL WATER DEMAND; Industrial	[acre-ft]	Annual water delivered to industrial customers
32	NONRESIDENTIAL WATER DEMAND; Comm/Instit	[acre-ft]	Annual water delivered to commercial and institutional customers
33	NONRESIDENTIAL WATER DEMAND; Tot Demand	[acre-ft]	Annual water delivered to industrial, commercial and institutional customers
34	LOSS Unacc/Distr	[acre-ft]	System losses (leaks, evaporation, water theft) and unaccounted for beneficial use (fire fighting, line flushing , construction, testing)
35	Ref Urban Per Capita Dmd	[gpcd]	CA DWR reference amount
36	Calculated Per Capita Dmd	[gpcd]	
37	TOTAL M&I DMND	[acre-ft]	Annual M&I water deliveried to residential and non-residential customers
38	TOTAL Ag/M&I Dmd	[acre-ft]	Overall District water demand of Ag and M&I water
39	UNMET DEMAND (dmnd - sup)	[acre-ft]	Used to determine if the analysis results in an over or shortage supply
40	Division:		USBR group name of disticts typically based on the water supply
41	District:		Name of the water district

Calculations (unit conversions may be necessary but not shown)

29 = (RESIDENTIAL WATER DEMAND; Tot Demand) / (RESIDENTIAL WATER DEMAND; Population)

33 = (NONRESIDENTIAL WATER DEMAND; Industrial) + (NONRESIDENTIAL WATER DEMAND; Comm/Instit)

36 = (TOTAL M&I DMND) / (RESIDENTIAL WATER DEMAND; Population)

37 = (RESIDENTIAL WATER DEMAND; Tot Demand) + (NONRESIDENTIAL WATER DEMAND; Tot Demand) + (LOSS Unacc/Distr)

38 = (TOTAL AG DMND) + (TOTAL M&I DMND)

39 = (TOTAL Ag/M&I Dmd) - (TOTAL SUPPLY)